



Canadian Women's Archives

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Sophia Jex-Blake's Doctoral Dissertation on Puerperal Fever

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Abstract

Sophia Jex-Blake (1840-1912) was among the first women to study medicine in a British university and an ardent champion of women's rights. Her doctoral dissertation, written at the University of Basel in 1877, was on puerperal fever. This dissertation enlightens us about Jex-Blake as a person and about medical beliefs and practices in the period. While Jex-Blake is sometimes thought of as an abrasive person, her dissertation reveals her as compassionate and sensitive. The dissertation shows that in the 1860s and 1870s, hospitals still neglected disinfection; it also documents the isolation and suffering of unwed mothers in this period.

Sophia Jex-Blake (1840-1912) is well known as one of the first women to study medicine in a British university and as an ardent champion of the view that women should have equal access to medical careers.¹ Her indomitable efforts were certainly influential in opening British Universities to women. Nevertheless, the obstacles Jex-Blake faced made it impossible for her to complete her own medical degree in England and so, in 1876, she went to Switzerland to finish her training. One year later she was awarded an M.D. from the University of Basel. As was then customary, one of the requirements for the degree was the completion of a dissertation. Jex-Blake wrote on puerperal fever, the great horror of the nineteenth century maternity clinics.

In the course of research on the history of puerperal fever, I recently found a copy of the Jex-Blake dissertation in the National Library of

Medicine in Washington D.C. This document seems to have received almost no attention either in Jex-Blake's time or in our own. Yet the dissertation is interesting; it enlightens us about Jex-Blake herself and about medical beliefs and practices in the middle of the nineteenth century, a time which was particularly important in the rise of modern medicine.

The following pages consist mainly of excerpts from the Jex-Blake dissertation; I have added a few explanatory comments and, at the end, I have suggested some conclusions that follow from the excerpted material.

In the middle of the nineteenth century, medical dissertations were customarily dedicated either to one's parents or to a favorite professor. Of the thirty or so dissertations on puerperal fever which I have examined, Jex-Blake's is the only

one that departs from this custom. Her dedication reads as follows:

Dedicated to the illustrious University of Bern and to those other universities which alone truly merit the name, inasmuch as they have never sought, by the forcible and arbitrary exclusion of one half the human race from the higher branches of education, to make either the treasures or the honours of academic learning the appanage of a single sex, but have welcomed and fostered the powers of each individual mind, accepting these as the natural and only limit to its acquirements, and to their public recognition.

In the Preface, Jex-Blake explains that it is her object to "collect into moderate compass the leading facts respecting past epidemics [of puerperal fever], and to recapitulate briefly the theories successively entertained concerning it." The first part of the dissertation recounts some of the major epidemics that occurred between 1664 and 1868; the third part, which constitutes over half of the total dissertation, reviews some of the major theories about childbed fever.

The second part of the dissertation, which is the most interesting for our purposes, consists of about eleven pages. In this short section, Jex-Blake relates observations which she made during an epidemic of puerperal fever. This epidemic occurred in the winter months of 1866 and 1867 while Jex-Blake was a student in the New England Hospital for Women and Children in Boston. After some introductory remarks, Jex-Blake turns to the specific case histories:²

On *Friday, Nov. 2nd*, A.S. was admitted to the Hospital and delivered of a female infant, which had apparently died two or three weeks previously; footling presentation. A.S. was a married woman, but exhibited evident signs of syphilis, and to this infection the death *in utero* was probably

due. On the following day, Saturday, one of the assistant doctors in the Hospital made a post-mortem examination of the foetus, removing the uterus and other organs, and being thus occupied probably for some hours.

I. On Sunday, Nov. 4th, K.M. entered the Hospital in the second stage of labour. Age 22; unmarried; primipara; vertex presentation; first position. She had had labour pains to a greater or less extent, since the preceding Thursday, and, being homeless and friendless, she had been exposed to great hardships, and had, on the morning of her admission, walked into Boston from a distance, and then wandered about the streets for hours before she was brought to the Hospital. It so happened that on her admission she was received and first examined by the assistant just mentioned, though subsequently delivered by another person. The baby (weighing 9 lbs) was born about 4 p.m., and a severe laceration of the perineum took place.

Tuesday, Nov. 6th.—The perineum showed slight symptoms of gangrene, and a yeast poultice was applied to it. In the evening the patient complained of abdominal pain and tenderness, and Ol: Tereb: [oil of turpentine] was applied externally on flannels.

Wednesday, Nov. 7th.—Distinct symptoms of peritonitis. The turpentine stupes were repeated and hot fomentations applied. Calomel gr. ij [two grains of chloride of mercury] and Pulv. Ipec. co. gr. x [ten grains of powdered ipecacuanha, an opiate] were given at 10 a.m. and repeated at noon. At 5.30 p.m. turpentine and castor oil were administered internally, and repeated three hours later. At 9.30 p.m. the bowels were moved for the first time, and the patient

experienced some relief. The opiates were continued.

Thursday, Nov. 8th.—The treatment was continued. At 4 p.m. an enema was given containing Ol: Ricini [castor oil]; and calomel gr. x was administered at 5 p.m. A mixture containing Spt. Eth. Nitr: [spirit of nitrous ether] and Mist. Camph: [camphor water] was also given hourly. At 8 p.m. Pulv. Ipec. co. gr. x. At 9 p.m. Tinct. Ferri Perchloridi [chloride of iron, generally used to control hemorrhage, sometimes, as here, perhaps, to induce contractions in the post-partum uterus] was ordered in gtt. iij [three drops] doses hourly.

Friday, Nov. 9th.—Died at 8 a.m. I have thought it right to give as fully as possible all the facts and incidents, whether peculiar to the patient or relating to the Hospital, which could possibly be supposed to influence the result in this case, as this was undoubtedly the starting point of the subsequent epidemic. It will be seen that there were an unusual number of concurrent circumstances which might or might not have a causal relation to the event, and each would be differently estimated by different authorities. The prevalence of slight cases of gangrene³ before the outbreak of an epidemic has been so often remarked in other instances that one cannot deny its possible importance. The *sectio cadaveris* of a partly decomposed foetus, and the subsequent examination of a parturient patient, must not be omitted from the record; though I state the facts with considerable reluctance, as the hospital rule in such matters was most rigid, and was in this instance broken by an oversight which never I think occurred, either previously or subsequently, during my three years' stay in the Hospital. The wretched state of the patient herself, both as regards mental anxiety and physical suffering, prior to admission, also pre-

sented precisely the conditions most favourable for serious illness and for a fatal issue, and thus formed a third element in the chain of causation of which it is difficult exactly to estimate the force. It is at least conceivable that no one of the factors in question would alone have produced the unhappy result, but it is certainly no marvel that in combination their influence was disastrous.

II. The next patient, B.C., entered the Hospital on *Monday, Nov. 12th*, and the membranes ruptured at 5 p.m. A boy weighing 8 lbs. was born at 4.45 a.m. on the following morning. Primipara; vertex presentation; first position. The perineum was slightly lacerated and symptoms of gangrene appeared the same evening. A yeast poultice was applied, and Pulv. Ipec. co. was administered.

On *Wednesday, 14th*, symptoms of peritonitis appeared on the left side. Calomel and Pulv. Ipec. co. were given every four hours. The perineal laceration was treated with yeast poultices, lotio nigrum [black mercurial lotion], and the occasional application of the fumes of Bromine.

On *Thursday, Nov. 15th*, the patient was somewhat better, and the treatment was continued, with the addition of a teaspoonful of brandy every two hours.

Friday, 16th—Treatment continued. Enema of chamomile tea.

Sunday, 18th.—Great improvement evident, though some tenderness still remained on the left side. From this time she made steady progress towards convalescence.

Thursday, 27th.—Discharged, well.

III. On *Saturday, Nov. 17th*, A.M. entered the Hospital and was delivered at 8.45 p.m. of a girl weighing 10 lbs.

On *Sunday, Nov. 18th*, she complained of pain in the left ovarian region, and some tenderness and swelling were noticed on the left side of the abdomen. The lochia were arrested; the skin was hot and dry, the tongue coated and the pulse rapid. A hop poultice was applied to the abdomen; and Calomel gr. j and Pulv. Ipec. co. gr. v were given every four hours. At 8 p.m. the skin became more moist and the lochia re-appeared.

Monday, 19th.—There was less pain and tenderness, and henceforth the patient steadily improved.

Wednesday, 28th.—Discharged, well.

IV. On *Wednesday, Nov. 21st*, E.K. entered and was delivered at 4 p.m. of a child weighing 5 ½ lbs. that only lived one hour. Multipara; vertex presentation; first position.

Thursday, 22nd.—Pain in abdomen; arrest of lochia; rapid pulse. Ol. Ricini was given, and, after the bowels had moved, Pulv. Ipec. co.

Friday, 23rd.—Still some abdominal pain and tenderness. Reappearance of lochia.

Saturday, 24th.—Improving. Brandy and lime water every two hours. From this time she gained steadily.

V. On *Friday, Nov. 23rd.*, K.B. entered the Hospital, stating that the waters had broken on the previous Tuesday. Primipara; vertex presentation; fourth position. On examination the os was found to be rigid, and the vagina dry. Labour made

little progress that day, and at bedtime the patient was given Pulv. Ipec. co. gr. iij. It happened that during the following night several out-cases occurred, and all the students were engaged except myself.

On *Saturday, 24th*, at 4 a.m., I was summoned to the obstetric wards to take charge of M.M. (whose case follows,) who entered in labour; and I was also directed to watch the slow advance of labour in K.B., though, except in such an emergency, two patients were never entrusted to the same student. For the next six hours, therefore, I remained in charge of both patients, who lay in adjoining rooms, communicating by an open door. I made several examinations, of course, of both patients at intervals, washing my hands carefully in each instance, but not using any disinfectant. During this period K.B. made very little progress, and the vagina remained hot and dry, and the os rigid. At 10 a.m. the charge of this patient was committed to another student, and I remained with M.M. I learned afterwards, however, that labour made no advance in K.B.'s case from 1 p.m. to 7.30 p.m., when forceps were applied, the head rotated to the first position, and delivery took place. There was some rupture of the perineum.

Sunday, 25th.—Symptoms of gangrene having appeared in the perineum, the fumes of bromine were applied, and yeast poultices. About 10 a.m. signs of peritonitis showed themselves, and Calomel gr. ij., Pulv. Ipec. co. gr. v. was given every three hours, but no improvement ensued. The child died in the course of the day.

Monday, 26th.—The gangrene extended to the vulva in spite of continued treatment by poultices and the fumes of bromine. The medicines as before. No improvement.

Tuesday, 27th.—The patient became restless and somewhat delirious, but a motion was obtained from the bowels, and it was hoped that improvement had set in. About midnight, however, she sprang out of bed during the nurse's momentary absence, ran to the closet and refused to return. She was carried back to bed and forcibly retained there. Morphia was given, and she became somewhat quieter.

Wednesday, 28th.—Kept under morphia. Died about midnight.

This poor woman was also single, and from the state of the vagina and uterus, and also from a wound found in the child's head at birth, it was conjectured that she had endeavoured to procure an abortion by instrumental means at the time of the rupture of the membranes, three days before her admission to the hospital, but she denied this to the last. The child was born in extremely feeble condition, and seemed somewhat premature. It survived only about 18 hours.

VI. On *Saturday, November 24th*, M.M. admitted at 4 a.m. Primapara, vertex presentation, second position. It appeared that the waters had broken at 2 p.m. on the previous day, but that she had continued her work, washing clothes in a cold room. It was the rule of the Hospital that, whenever time permitted, the bowels of each patient should be moved on entrance either by a dose of Ol. Ricini or by an enema. As, however, M.M. reported that hers had moved quite recently, I omitted this measure, to my great subsequent regret.

The baby was born about noon on Saturday; the uterus contracted firmly; there was no perineal laceration; the patient seemed well and in excellent spirits.

Sunday, Nov. 25th.—Appeared well in the morning, but in the afternoon feverish symptoms supervened, with headache and abdominal tenderness. Ol. Tereb. was applied to the abdomen, and Calomel gr. ij, Pulv. Ipec. co. gr. v. was given. Brandy and lime water were administered every two hours; and Mist. Camph. with Spt. Eth. Nitr. every four hours. In the morning she micturated naturally, but in the evening, and subsequently, required the use of the catheter.

Monday, 26th.—I was summoned to catheterize her at 4.30 a.m. and found the urine dark but copious. Remedies continued as before. Poultices were applied to the abdomen in the afternoon; and as the vulva appeared pale and presented a small black spot, it was treated with the fumes of bromine. There was some vomiting and much restlessness during the day, but in the evening she seemed rather better and the abdomen was less tender.

Tuesday, 27th.—Increase of fever and of abdominal pain, with nausea. Ol. Ricini was given both by the mouth and as an enema with Ol. Tereb.; and Calomel and Pulv. Ipec. co. were also administered, but no stools were obtained, in spite of the repetition of the enema.

Wednesday, 28th.—The abdominal pain became very severe, and morphia was administered. Ol. Tereb. and Ol. Ricini. were applied externally to the abdomen, and Pil. Hydrarg. gr. v. [a mercury pill] was also given. Brandy and milk were given, also whiskey and ice, and lime water as a drink. Spt. Ammon. arom. [aromatic spirit of ammonia] was prescribed, alternately with a solution of Potass. Chlorat. [Potassium Chlorate]. The bowels were moved slightly, and in the evening green vomit appeared. The breathing became stertorous towards

night, and she lost consciousness about midnight.

Thursday, 29th.—Death occurred about 9 a.m., and at the moment of decease the patient vomited a quantity of fluid of a deep yellow color, and passed a liquid stool in the bed. There had been no dejection whatever from Friday, Nov. 23rd, shortly before labour set in, until the afternoon of Wednesday, 28th, when the relief was very small and insufficient.

M.M. was also unmarried, and she had gone through great anxiety and some privation during her pregnancy. It was ascertained after her death that on the night succeeding her delivery she had risen from her bed, and walked with bare feet across the ward to drink cold water at the tap.

VII. On *Sunday, Nov. 25th*, C.P. entered the Hospital in a very excitable state. Primipara, vertex presentation, first position.

Monday, Nov. 26th.—Membranes ruptured at 3 a.m., and a child weighing 8½ lbs. was born at 9 a.m. The perineum was severely lacerated, and some hæmorrhage occurred. Tr. Secale Corn. [tincture of ergot] was given.

Tuesday, 27th.—Very comfortable. No signs of gangrene in the perineum.

Wednesday, 28th.—A dose of Ol. Ricini was given and the bowels moved.

Thursday, 29th.—Became restless, especially at night. Tr. Hyoscyam. [tincture of hyoscyamus (henbane)] was given.

Friday, 30th.—At 4 a.m. she began to complain of abdominal pain, and vomiting ensued. Pil Hydrarg. gr. viij. was given and Ol. Tereb. applied to the abdomen.

Saturday, Dec. 1st.—She seemed better in the morning; the pulse was slower, and the tenderness and swelling of the abdomen had diminished. Morphia was injected subcutaneously. In the afternoon a typhoid condition supervened, with loose yellow stools and frequent vomiting. Delirium came on towards night, and increased in violence.

Sunday, Dec. 2nd.—Died at 6 a.m.

C.P. was also a single woman, belonging to a class greatly superior to that of the other patients, and during her illness she showed acute consciousness of her sad position, and of the distress which she had occasioned to her family. She also bore traces of syphilitic infection.

VIII. On *Wednesday Nov. 28th.*, S.O. entered the Hospital, and was delivered the same day.

Saturday, Dec. 1st.—Slight abdominal pain came on and continued the following day.

Wednesday, Dec. 5th.—All unfavourable symptoms had disappeared.

Dec. 14th.—Discharged, well.

After the death of C.P. on Dec. 2nd, it was considered necessary to close the wards; as, out of nine patients delivered during November, four had died. No new cases were therefore received for a fortnight, and during the interval the wards were thoroughly cleaned, fumigated, painted, and whitewashed. When re-opened there was no recurrence of the fever, and the patients who were admitted during the latter part of December and the first week of January all did well, and in only one instance was there even the slightest abdominal tenderness. At

the expiration of this period, one more fatal case occurred.

IX. On *Tuesday, January 8th, 1867*, M.O. entered the Hospital, having had no labour pains since the previous day.

Wednesday, Jan. 9th.—Membranes ruptured at 2 a.m.; but little progress was made during the day.

Thursday, 10th.—As the head was in the third position, and no advance occurred, the forceps were applied at 3 p.m., and a dead child weighing 9 lbs. was extracted.

At 5 p.m. the patient had a rigor which lasted for twenty minutes, and the pulse rose to 130. Profuse perspiration and slight delirium, with great restlessness. *Mist. Camph. and Spt. Eth. Nitr.* were given; she became quieter, and slept tolerably.

Friday, 11th.—Comfortable in the morning. At 5 p.m. a rigor again supervened, the abdomen became painful and tender, and the lochia offensive; pulse 120. *Ol. Tereb.* as applied externally, and *morphia*, gr. $\frac{1}{4}$, given every three hours. She then slept a little.

Saturday, 12th.—Pulse 120. Tongue dry and red. Less pain in the abdomen.

Sunday, 13th.—Again a rigor in the evening. *Morphia* continued.

Monday, 14th.—Pulse 120. Abdomen tender. Some delirium during previous night. Dr. Bowditch and Dr. Sparehawk called in consultation, prescribed *Ol. Ricini* [one half Troy ounce] and *Tr. Verat. Virid. gtt. v.* [five drops of tincture of *veratrum viride*] every three hours. [Here, in a footnote, Jex-Blake quotes a sentence from Sir James Simpson about this drug.] After

the second dose of *Veratrum* the patient vomited, and it was stopped at night. *Morphia* was given, and mustard plasters applied, but vomiting persisted, with delirium.

Tuesday, 15th.—Brandy was given freely. The vomiting ceased, and the patient grew quieter. All food was vomited except alcohol. A rigor again occurred in the evening.

Wednesday, 16th.—Violent delirium in the morning, succeeded by unconsciousness about 1 p.m. Pulse 150 and very feeble.

Death occurred at 5 p.m.

After a brief discussion of the anatomical findings in some of the preceding cases, Jex-Blake considers possible causes of the cases she has reported. This discussion ends with the following observations:

[In the second of the above cases] the element of contagion was not wholly excluded, but it is more probable that the fatal result was due to the unsuccessful attempts to procure abortion to which the patient pleaded guilty, and to the state of great mental depression in which she subsequently entered the hospital. It is also recorded that she had caused great compression of her abdomen during pregnancy by extreme tight lacing. The other patients in the house at this time all did well.

It is certainly worth remark that, of the eight patients who took the fever during the November epidemic, three were married and five were single women, and that among the former there was no fatal case, while all the four deaths occurred among the latter. It has been a matter of very frequent observation that mental anxiety and trouble greatly increase the gravity of prognosis during epidemics, and that for this reason single women are much more fre-

quently victims of puerperal fever than those in happier circumstances. [Jex-Blake has a footnote reference to various authors who had made this point.]

These passages suggest some conclusions about Jex-Blake and about mid-nineteenth century medical practices and beliefs regarding childbed fever. One sometimes encounters insinuations that Jex-Blake was a forceful if not abrasive person. By contrast her case histories reveal her as exceptionally sensitive and compassionate. Personal details of the kind she regularly provided, which make her case histories so interesting and moving, were not usually included in medical publications. Their presence clearly reveals a side of Jex-Blake's personality that is easily overlooked when one reads only of her battles with narrow-minded officials and bigoted students.

It has been said that Jex-Blake was probably the most intelligent of the women who first pioneered the women's medical movement.⁴ Her intelligence and perspicacity are clearly demonstrated in her case histories and even more, perhaps, in other parts of her dissertation. She gave extensive attention to English and French literature on puerperal fever and some attention to German language publications as well. Unfortunately, she ignored the possibility that childbed fever was caused by microorganisms—a possibility that was then beginning to receive serious attention especially in German language medical publications and that ultimately provided the key to understanding this horrible disease.⁵ Nevertheless, Jex-Blake's survey of the literature was certainly more comprehensive and insightful than most comparable surveys in other dissertations written at the time.

In 1860 Ignaz Semmelweis published his *Etiology of Childbed Fever*; in this work he demonstrated clearly that almost every case of the disease could be prevented by proper aseptic techniques.⁶ The epidemic which Jex-Blake recorded in her case histories occurred six years later. It is

significant that in 1866 the New England Hospital for Women and Children obviously still lacked enlightened guidelines for disinfection. Jex-Blake explains that it was against the hospital policy for examining physicians to conduct autopsies⁷, but she also indicates that when she repeatedly examined two patients, while she did wash each time she went from one to the other, she did not see any need to use a disinfectant. It is even more significant that after another ten years, when her dissertation was written, there was still no clear recognition that the infectious theory was correct. Jex-Blake devotes about four pages to Semmelweis,⁸ and she mentions that most physicians regarded puerperal fever as a kind of wound infection, yet that view was by no means the only one to which she gave serious attention.

The case histories provide clear and poignant evidence of the isolation and hopelessness which unwed mothers endured in the middle of the nineteenth century. As one becomes aware of the horrible ravages of puerperal fever in nineteenth century maternity wards, one may begin to wonder why women continued to seek admission there. As one sees from the case histories, they simply had no alternative. Through these decades one finds, even in medical literature, occasional suggestions that puerperal fever was regarded as retribution for the immorality of its victims. Similar thinking may have led to a general indifference to the suffering of unwed mothers.

The middle decades of the nineteenth century were a crucial time in the history of medicine. In these years, the conceptual foundations of medicine underwent more fundamental changes than at any other time in history. Moreover, the admission of women to the profession shows that the social organization of medicine was undergoing a similar revolution. Sophia Jex-Blake's dissertation is a particularly interesting document because it sheds light on the changes

that were occurring both in the theoretical and in the social aspects of medicine.

NOTES

1. Margaret G. Todd wrote a biography of Sophia Jex-Blake, *The Life of Sophia Jex-Blake*, (London: Macmillan, 1918), and there have been other brief biographical accounts. See, for example, Beatrice S. Levin, *Women and Medicine*, (Metuchen, N. J. and London: The Scarecrow Press, Inc., 1980), pp. 85-92.
2. In the following excerpts, I have retained the original punctuation and spelling. Jex-Blake usually referred to various medical preparations by abbreviations of their Latin names; I have added the English names (and dosages) in brackets at the first mention of each preparation.
3. At the beginning of this part of the dissertation, Jex-Blake reported that cases of gangrene had occurred in the Hospital. Levin, p. 87.
5. K. Codell Carter, "Ignaz Semmelweis, Carl Mayrhofer, and the Rise of Germ Theory", forthcoming in *Medical History*.
6. In the epidemic that Jex-Blake reported, the mortality rate exceeded fifty percent. Semmelweis argued that aseptic procedures would prevent all cases of puerperal fever except those resulting from decomposition of organic matter within the patient herself—a process which he referred to as self-infection. He calculated that about one percent of patients would contract the disease in this way. Ignaz Semmelweis, *The Etiology, Concept, and Prophylaxis of Childbed Fever*, (Madison, Wisconsin: University of Wisconsin Press, 1983), pp. 114, 118.
7. One common *misconception* was that Semmelweis had associated puerperal fever with cadaverous poison. Acting on this mistaken view, various maternity hospitals prevented even indirect contact between cadavers and newly delivered patients. Semmelweis himself emphasized that this was a misconception of his work and that it led to inadequate precautions against the disease, but the view continued to be promulgated. Semmelweis, pp. 28f, 42-44.
8. Jex-Blake discusses Semmelweis on pages 19f and 76f of her dissertation.